عنوان مقاله:

Parametric Study of Free-Field and Surface Response of Axisymmetric Elastic Half-Spaces under Surface Explosions

محل انتشار:

نهمین کنگره بین المللی مهندسی عمران (سال: 1391)

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نویسندگان:

Naghmeh Safaei - *MS Student, Civil and Environmental Engineering Department, Shiraz University, Shiraz, Iran*

Golnaz Hoormazdi
Maryam Delfi
Mahmoud-Reza Banan

خلاصه مقاله:

Modeling of elastic half-spaces and wave propagation within half-spaces under dynamic impulse loading has numerous applications. Although half-space response is nonlinear near explosion site, it is shown in the paper that by excluding nonlinear zone assuming a crater, the surface and free field responses can be accurately modeled using elastic dynamic analyses. Explosion loading is modeled as a dynamic impulsive pressure on the crater surface. Explosion pressure and impulse are determined based on explosion charge weight. The axisymmetric half-space with absorbing boundaries is modeled using ANSYS finite element software. The half-space responses namely free-field peak stress (PS) and peak particle velocity (PPV) and surface PPV are correlated to half-space design parameters and loading through a parametric study varying ground properties and explosion magnitude. Accuracy of the proposed dynamic modeling has been shown by comparing the obtained results with design formula presented in the explosion design manual TM5-855-1 for soil media

کلمات کلیدی:

Surface explosion, Elastic axisymmetric half-space, Free-field response, ANSYS dynamic finite element analysis, Peak particle velocity, Peak particle pressure